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DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed April 16, 2003 have been acknowledged.

2. Examiner acknowledges amended claims 1-22 and 30-46.

3. The rejection of claims 1-7, 15-19 and 30-32 under 35 U.S.C. 102 (b) as being anticipated by Dudek, U.S. Patent Number 3,869,113 is withdrawn due to applicant's argument.

4. The rejection of claims 1-2, 4-8 and 11-13 under 35 U.S.C. 103 (a) as being unpatentable over Dudek, U.s. Patent Number 3,869,113 in view of Williams et al., U.S. Patent Number 5,363,929 is withdrawn due to applicant's argument.

5. The rejection of claims 21-25 under 35 U.S.C. 103(a) as being unpatentable over Clinard, U.S. Patent Number 4,108,508 in view Dudek, U.S. Patent Number 3,869,113 is withdrawn to applicant's argument.

6. The rejection of claims 21-28 under 35 U.S.C. 103 (a) as being unpatentable over Clinard, U.S. Patent Number 4,108,508 in view of Dudek, U.S. Patent Number 3,869,113 and in further view of Williams, U.S. Patent Number 5,363,929 is withdrawn due to applicant's argument.

7. The rejection of claims 30-40 under 35 U.S.C. 103(a) as being unpatentable over Dudek, U.S. Patent Number 3,869,113 in view of Williams, U.S. Patent Number 5,363,929 is withdrawn due to applicant's argument.

8. The rejection of claims 30 and 41-44 under 35 U.S.C. 103(a) as being unpatentable over Dudek in view of Clinard, U.S. Patent Number 4,108,508 is withdrawn due to applicant's argument.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dudek, U.S. Patent Number, 3,869,113 in view of William et al., U.S. Patent Number 5,363,929 and in further view of Clinard, U.S. Patent Number 4,108,508.

Dudek discloses a high load damper laminate comprising a plurality of elastomeric layers including at least one circumferentially-oriented and concentrically-oriented fiber cord wherein the circumferentially-oriented cord contains the first and third composite layers and sub-layers (see column 3, lines 10-53). Additionally, the reference discloses a plurality of elastomeric layers that include at least one axially and biaxially-oriented cord, which comprises the second and third composite layers and sub-layers. It is disclosed by Dudek that the elastomeric layers are laminated together (see Figure 3C and column 3, lines 10-53. In reference claim 4, Dudek discloses that the cords in the elastomeric layers are aligned at an angle to the axis of the inner and outer members. In addition, the reference discloses that the laminate is a polyester-calendered fabric (see reference claim 11). Dudek also discloses that the fibers in the layers are arcuate-shaped since they are concentrically and axially oriented in Figures 2, 3A, 3B and 3C). Column 3, lines 10-53 of the reference disclose that the concentrically-oriented fibers surround a section of the elastomeric layers. Although the Dudek reference does not specifically disclose at

least four elastomeric layers. Dudek does; however, disclose that a plurality of elastomeric layers can be used to increase load-bearing capabilities. Therefore, it would have been obvious to one of ordinary skill in the art to have four elastomeric layers with axial cords in order to provide great strength to the shim (see column 1, lines 17-21). Figures 1-3C of the Dudek reference also disclose that the elastomeric fiber reinforced layers include axial fibers which are oriented at a positive rotationally angle in one layer and a negative rotational angle in another layer (see column 3, lines 53-58). Additionally, Figure 1 of the Dudek reference discloses that the composite is cylindrical and the fibers are longitudinal as per instant claims 41 and 42. Figures 2-3C of Dudek disclose that the composite has an axis in the center of the damping wherein the fibers surround the axis.

The Dudek reference does not disclose that the axes in the elastomeric layers are arranged in a 0°, +45°, -45° and 90° orientation or 90°, -45°, +45° and 0°. Williams teaches a motor composite comprising layers of fibers oriented at an angle of 0°, +/-45° and 90° (see column 5, line 17-column 6, line 58). The orientation of the fibers affects the torsional strength, compression strength and bending flexibility. Therefore, it would have been obvious to one of ordinary skill in the art to have the fibers in the elastomeric layer have an orientation at 0°, +/-45° and 90° in order to have greater compression strength and load bearing characteristics. The types of cords are not disclosed in the Dudek reference. Column 4, lines 43-60 of the Williams reference teaches that the reinforcing fibers include carbon, glass or aramid fibers. It would have been obvious to one of ordinary skill in the art to use the fibers disclosed by the Williams reference in the Dudek reference because carbon, glass or aramid fibers have strength and stretch characteristics.

The Dudek reference does not disclose that the laminate comprises an epoxy as per instant claim 12. Column 4, lines 57-60 of the Williams reference teaches that a thermoset epoxy resin is suitable to form the resin matrix body. It is well known in the art that epoxy resin is compatible with a variety of fibers such as glass, carbon and aramid. Therefore, it would have been obvious to one of ordinary skill in the art to have the reinforcing fibers in an epoxy resin in order to have greater compression bearing capabilities.

Dudek does not disclose that at least one fiber is comprised of a spiral as per instant claim 33. Figures 3-5 of the Williams reference teaches that the fibers are offset by an angle and spiral around the laminate for the length of the composite. The arrangement of the fibers affects the bending flexibility and torsional strength. Therefore, it would have been obvious to one of ordinary skill in the art to arrange the fibers in a spiral in order to have greater load-bearing characteristics.

Neither Dudek nor Williams disclose that the layers are nonextensible. Clinard teaches a composite shim comprising at least four resilient layers and at least three layers of nonextensible material reinforced with high strength fibers (see column 5, lines 13-32). Figure 2 of the Clinard reference disclose that the elastomeric and nonextensible layers are laminated in an alternating manner. The nonextensible layers assist in relieving stress from the composite. Therefore, it would have been obvious to one of ordinary skill in the art to have nonextensible layers in the shim so as to provide a composite with high load-bearing characteristics.

Neither Dudek nor Williams disclose that the shim is frustroconical. Clinard teaches a frustroconical laminated bearing. The frustroconically shaped side surface of the laminated bearing allows the composite to effectively respond to rotational and compressional loads.

Therefore, it would have been obvious to one of ordinary skill in the art to have frustroconical laminated bearing in order to effectively handle heavy loads.

None of the references disclose the thickness of the composite as per instant claims 14 and 29. The thickness of the shim affects the load-bearing capabilities of the shim. Discovery of optimum values of result effective variables only involve routine skill in the art in re Boesch, 617 F2. 2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have a composite shim with a thickness between 0.01 to 0.5 inches in order to provide a shim that can handle heavy loads.

11. Claims 30 and 42-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dudek, U.S. Patent Number 3,869,113 in view of Hatch, U.S. Patent Number 4,207,778. Dudek discloses a high load damper laminate comprising a plurality of elastomeric layers including at least one circumferentially-oriented and concentrically-oriented fiber cord wherein the circumferentially-oriented cord contains the first and third composite layers and sub-layers (see column 3, lines 10-53). Additionally, the reference discloses a plurality of elastomeric layers that include at least one axially and biaxially-oriented cord, which comprises the second and third composite layers and sub-layers. It is disclosed by Dudek that the elastomeric layers are laminated together (see Figure 3C and column 3, lines 10-53. In reference claim 4, Dudek discloses that the cords in the elastomeric layers are aligned at an angle to the axis of the inner and outer members. In addition, the reference discloses that the laminate is a polyester-calendered fabric (see reference claim 11). Dudek also discloses that the fibers in the layers are arcuate-shaped since they are concentrically and axially oriented in Figures 2, 3A, 3B and 3C). Column 3, lines 10-53 of the reference disclose that the concentrically-oriented fibers surround a

section of the elastomeric layers. Although the Dudek reference does not specifically disclose at least four elastomeric layers. Dudek does; however, disclose that a plurality of elastomeric layers can be used to increase load-bearing capabilities. Therefore, it would have been obvious to one of ordinary skill in the art to have four elastomeric layers with axial cords in order to provide great strength to the shim (see column 1, lines 17-21). Figures 1-3C of the Dudek reference also disclose that the elastomeric fiber reinforced layers include axial fibers which are oriented at a positive rotationally angle in one layer and a negative rotational angle in another layer (see column 3, lines 53-58). Additionally, Figure 1 of the Dudek reference discloses that the composite is cylindrical and the fibers are longitudinal as per instant claims 41 and 42. Figures 2-3C of Dudek disclose that the composite has an axis in the center of the damping wherein the fibers surround the axis.

The Dudek reference does not disclose that the axes in the elastomeric layers are arranged in a 0°, +45°, -45° and 90° orientation or 90°, -45°, +45° and 0°. Williams teaches a motor composite comprising layers of fibers oriented at an angle of 0°, +/-45° and 90° (see column 5, line 17-column 6, line 58). The orientation of the fibers affects the torsional strength, compression strength and bending flexibility. Therefore, it would have been obvious to one of ordinary skill in the art to have the fibers in the elastomeric layer have an orientation at 0°, +/-45° and 90° in order to have greater compression strength and load bearing characteristics. The types of cords are not disclosed in the Dudek reference. Column 4, lines 43-60 of the Williams reference teach that the reinforcing fibers include carbon, glass or aramid fibers. It would have been obvious to one of ordinary skill in the art to use the fibers disclosed by the Williams

reference in the Dudek reference because carbon, glass or aramid fibers have strength and stretch characteristics.

The Dudek reference does not disclose that the composite comprises at least one outer periphery lateral fiber as per instant claim 46. Hatch teaches a reinforced cross-ply composite comprising a plurality of fiber-containing layers wherein the fibers are parallel to each other and extend from one end of the layer to the other ends of the layer (see column 1, lines 44-64 and Figure 1). In column 4, lines 29-36 of the hatch reference, it is disclosed that parallel circumferentially extended fibers are in the rim in order to strengthen the composite. Therefore, it would have been obvious to one of ordinary skill in the art to have at least one outer periphery later fiber in order to provide strength to the composite as shown by the Hatch reference in column 4, lines 29-36.

Response to Arguments

12. Applicant's arguments filed April 16, 2003 have been fully considered but they are not persuasive. Applicant's arguments with respect to claims 1-45 have been considered but are moot in view of the new ground(s) of rejection. Applicant argues that the combination of the Dudek and Hatch references is improper. Both references disclose high load bearing composites that wherein the construction is based on circumferentially extended fibers. Therefore, Dudek and Hatch are analogous art. Obtaining a composite with great compression strength, bending flexibility and torsional strength is the motivation to combine the references. The rejection of claims 30 and 42-46 as being unpatentable over Dudek, U.S. Patent Number 3,869,113 in view of Hatch, U.S. Patent Number, 4,207,778 is maintained.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (703) 305-4488. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly, can be reached at (703) 308-0449. The fax phone numbers for the Group are (703) 872-9310 {before finals} and (703) 872-9311 {after finals}.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is
(703) 308-0661.

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